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Poster Sessions

Glutamatergic neurons from medial prefrontal cortex to dorsal raphe nucleus regulates maternal aggression in mice

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Lactating female mice nurture their pups and attack intruders in their territory. These behaviors are the representatives of maternal behavior. The neuronal mechanisms underlying each distinct behavior have yet to be clarified. The dorsal raphe nucleus (DRN) regulates both maternal care and aggression. In the present study, we investigated whether the glutamatergic signals from the medial prefrontal cortex (mPFC) to the DRN is involved in regulating maternal care and aggression in lactating female mice. Injections of N-methyl-D-aspartic acid (NMDA) receptor antagonists or α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA)/kainate receptor antagonists into the DRN decreased the frequency of biting behavior, while injection of NMDA or AMPA inhibited maternal care. In dams that were injected with a retrograde tracer Fluorogold into the DRN, the number of c-Fos- and Fluorogold-positive neurons in the mPFC increased in the dams that displayed biting behavior in response to an intruder. Furthermore, optogenetic activation or inhibition of glutamatergic neurons projecting from the mPFC to the DRN increased or decreased the frequency of biting behavior, respectively. On the other hand, the optogenetic manipulations did not affect the display of maternal care. These results suggest that glutamatergic neurons from the mPFC to the DRN regulate maternal aggression, but not maternal care, in lactating female mice.